CLAIMS

1. Device for making a material collide in a rotating system, comprising:

- a rotor which can rotate about a central axis of rotation in clockwise direction, here called forward, as well as in anti-clockwise direction, here called backward;

- at least one forward guide member, which is supported by the said rotor and is provided with a forward directed guide face with an inner and an outer edge, for accelerating and guiding a stream of the said material which, in a region close to the said axis of rotation, is metered on the said rotor, which guide member extends in the direction of the external edge of the said rotor, which material comes off the said forward guide member and is send into a backward spiral stream (Sb), when rotating forward and when seen from a viewpoint which moves together with the said forward guide member;

- at least one backward guide member, which is supported by the said rotor and is at least provided with a backward directed guide face with an inner and an outer edge, for accelerating and guiding a stream of the said material which, in a region close to the said axis of rotation, is metered on the said rotor, which guide member extends in the direction of the external edge of the said rotor, which material comes off the said backward guide member and is send into a forward spiral stream (Sf), when rotating backward and when seen from a viewpoint which moves together with the said backward guide member;

- at least one forward impact unit which is supported by the said rotor and is linked with the said forward guide member and consists of at least one forward impact member which is provided with a forward directed impact face, which is associated with the said forward guide member for simultaneously loading and accelerating the said stream of material on impact when rotating forward, which forward directed impact face lies entirely behind, when seen in the direction of rotation, the radial line on which is situated the location where the said as yet uncollided stream of material leaves the said forward guide member, and at a greater radial distance from the said axis of rotation than the location at which the said as yet uncollided stream of material leaves the said forward guide member, the position of which forward impact face is determined by the forward synchronisation angle (θf) between the radial line on which is situated the location where the said as yet uncollided stream of material leaves the said forward guide member and the radial line on which is situated the location where the said backward spiral stream (Sb) of the said as yet uncollided stream of material and the forward path (Cf) of the said forward impact face intersect one another, which forward synchronisation angle (θf) is selected in such a manner that the arrival of the said as yet uncollided material at the location where the said backward spiral

stream (Sb) and the said forward path (Cf) intersect one another is synchronized with the arrival at the same location of the said forward impact face, which said forward impact face is directed virtually transversely, when seen in the plane of the rotation, to the said backward spiral stream (Sb) which the said as yet uncollided material describes, when seen from a viewpoint which moves together with the said forward impact member;

- at least one backward impact unit which is supported by the said rotor and is linked with the said backward guide member and consists of at least one backward impact member which is provided with a backward directed impact face, which is associated with the said backward guide member for simultaneously loading and accelerating the said stream of material on impact when rotating backward, which backward directed impact face lies entirely behind, when seen in the direction of rotation, the radial line on which is situated the location where the said as yet uncollided stream of material leaves the said backward guide member, and at a greater radial distance from the said axis of rotation than the location at which the said as yet uncollided stream of material leaves the said backward guide member, the position of which backward impact face is determined by the backward synchronisation angle (θb) between the radial line on which is situated the location where the said as yet uncollided stream of material leaves the said backward guide member and the radial line on which is situated the location where the said forward spiral stream (Sf) of the said as yet uncollided stream of material and the backward path (Cb) of the said backward impact face intersect one another, which backward synchronisation angle (θb) is selected in such a manner that the arrival of the said as yet uncollided material at the location where the said forward spiral stream (Sf) and the said backward path (Cb) intersect one another is synchronized with the arrival at the same location of the said backward impact face, which said backward impact face is directed virtually transversely, when seen in the plane of the rotation, to the said forward spiral stream (Sf) which the said as yet uncollided material describes, when seen from a viewpoint which moves together with the said backward impact member: in such a way that the said forward directed second spiral stream does not interfere with any of the forward directed impact faces.

2. Device according to claim 1, having:

- the said forward impact unit being provided with at least two forward impact members, which each have a forward impact face that can be individually associated with the said forward guide member;

- the said backward impact unit being provided with at least two backward impact members, which each have a backward impact face that can be individually associated with the said backward guide member.

3. Device according to claim 2, the said individual associations being achieved by changing at least the position of the said guide face of the said guide member.

4. Device according to claim 2, the said individual associations being achieved by changing at least the position of the said impact face of the said impact member.

5. Device according to claim 1, having a configuration of:

- at least two similar forward impact units being circumferentially disposed uniformly at equal angular distances around the said axis of rotation;

- backward impact units, in number equal to the forward impact units, being circumferentially disposed uniformly at equal angular distances around the said axis of rotation.

6. Device according to claim 5, the configuration being symmetric with each of the said forward guide members arranged together with a said backward guide member, as an arranged pair next to each other, virtually completely joined together back to back, as a adjacent guide combination.

7. Device according to claim 5, the configuration being symmetric with each of the said forward guide members arranged together with a said backward guiding member, as an arranged pair next to each other, virtually partly joined together back to back, with the respective inner sections positioned close to each other, with the outer sections positioned at further distance from each other than said inner sections, as an inner guide combination.

8. Device according to claim 5, the configuration being symmetric with each of the said forward guide members arranged together with a said backward guiding member, as an arranged pair next to each other, virtually partly joined together back to back, with the respective outer sections positioned close to each other, with the inner sections positioned at further distance from each other than said outer sections, as an outer guide combination.

9. Device according one of the claims 6 to 8, having the said backward guide face of the said guide combination functioning as a forward pre-guide face when rotating forward, and vice versa when rotating backward.

10. Device according to claim 8, having a pre-guide member positioned essentially symmetrically between said inner sections, which pre-guide member is provided with a pre-guide face for pre-guiding of the material, with the said pre-guide face functioning forward when rotating forward, and vice versa when rotating backward.

11. Device according to one of the preceding claims 5 to 10, with the said guide combination being movable supported by the said rotor in such a way that the said guide combination can be positioned into forward and backward position.

12. Device according to claim 11, with the said guide combinations being movable around a first point at a location essentially between said combined guide members.

13. Device according to claim 12, with the said guide combinations being pivotly attached to the rotor a first pivot at a location essentially between said combined guide members.

14. Device according to claim 13, with the radial distance between the said axis of rotation and the point of gravity of the said pivotly attached guide combination being smaller then the equal radial distance to the location of the said first pivot, in such a way that the said pivotly attached guide combination is self-positioning, which is achieved by having the guide combination tumble automatically into forward and backward position when the direction of rotation is reversed from forward into backward and visa versa.

15. Device according to one of the preceding claims 11 and 12, with the said guide combinations being manually adjustable attached to the rotor at a location essentially between said combined guide members.

16. Device according to one of the preceding claims 1 to 15, the said guide faces being not of straight design at least in longitudinal direction.

17. Device according to claim 5, the configuration being symmetric with each of the said forward impact members arranged together with a said backward impact member, as an arranged pair next to each other, virtually completely joined together back to back, as a adjacent impact combination.

18. Device according to claim 5, the configuration being symmetric with each of the said forward impact members arranged together with a said backward impact member, as an arranged pair next to each other, virtually partly joined together back to back, with the respective inner sections positioned close to each other, with the outer sections positioned at further distance from each other than said inner sections, as an inner impact combination.

19. Device according to claim 5, the configuration being symmetric with each of the said forward impact members arranged together with a said backward impact member, as an arranged pair next to each other, virtually partly joined together front to front, with the respective outer sections positioned close to each other, with the inner sections positioned at further distance from each other than said outer sections, as an outer impact combination.

20. Device according to claim 19, the impact faces of the said outer impact combination being connected together at least along their bottom edges with a plate, in such a way that a bed of own material can be formed on said plate between said impact faces, which said bed acts as an autogenous impact face.

21. Device according to one of the preceding claims 17 to 20, with the said impact combination being movable supported by the said rotor in such a way that the said impact combination can be positioned into forward and backward position.

22. Device according to claim 21, with the said impact combinations being movable around a second point at a location essentially between said combined impact members.

23. Device according to claim 22, with the said impact combinations being pivotly attached to the rotor at a second pivot at a location essentially between said combined impact members.

24. Device according to claim 23, with the radial distance between the said axis of rotation and the point of gravity of the said pivotly attached impact combination being smaller then the equal radial distance to the location of the said second pivot, in such a way that the said pivotly attached impact combination is self-positioning, which is achieved by having the impact combination tumble automatically into forward and backward position when the direction of rotation is reversed from forward into backward and visa versa.

25. Device according to claim 21, with the said impact combinations being manually adjustable attached to the rotor at a location essentially between said combined impact members.

26. Device according to one of the preceding claims 5 to 25, the said impact faces being not of straight design at least in longitudinal direction.

27. Device according to one of the preceding claims 5 to 26, having a super-symmetric configuration:

- with the said forward and the said backward guide members being arranged together as guide combinations;

- with the said forward and the said backward impact members being arranged together as impact combinations.

28. Device according to one of the preceding claims 1 to 27, having a hollow impact ring which has a trough structure which is at least partly open along the side facing the said axis of rotation, which circular hollow impact ring is supported by said rotor and is located concentrically around the said axis of rotation at a greater radial distance from said axis of rotation than the outer edge of said guide member, in which trough structure a co-rotating autogenous bed of own material is formed.

29. Device according to claim 28, with the said impact ring having at least one opening for discharging of the material

30. Device according to claim 28, with at least one said impact unit being positioned in said impact ring.

31. Device according to one of the preceding claims 1 to 30, with at least one circular hollow balance ring attached to the said rotor, the centre of which said circular balance ring coincides with the said axis of rotation, which said hollow balance ring is at least partly filled

with oil and contains at least one ball for reducing vibration of the said rotor.

32. Device according to claim 31, with the said ball being composed of a metal alloy.

33. Device according to claim 31, with the said ball being composed of ceramic material.
